Model Curriculum

QP Name: Ice Cream Processing Technician

QP Code: FIC/Q2004

QP Version: 3.0

NSQF Level: 4

Model Curriculum Version: 3.0

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Training Parameters

Sector	Food Processing
Sub-Sector	Dairy Products
Occupation	Processing-Dairy Products
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2004/7413.50
Minimum Educational Qualification and Experience	1. 11th grade pass without experience OR 2. Completed 1st year of 3-year diploma (after 10th) and pursuing regular diploma OR 3. 10th grade pass plus 1-year NTC/ NAC OR 4. 10th Class Pass with 2 years of relevant experience OR 5. Previous relevant qualification of NSQF Level 3 with 2 years of relevant experience OR 6. Previous relevant qualification of NSQF Level 3.5 with 1 years of relevant experience
Pre-Requisite License or Training	1. Food standards and regulations 2. Operating different types of dairy processing equipment 3. Packaging technology 4. GMP 5. HACCP 6. QMS 7. Computer basics and ERP system followed by the organization 8. Training in Food Safety Standards and Regulations (as per FSSAI) (Mandatory)

Minimum Job Entry Age	18 years
Last Reviewed On	29-07-2021
Next Review Date	28-07-2024
NSQC Approval Date	29-07-2021
QP Version	3.0
Model Curriculum Creation Date	31-06-2021
Model Curriculum Valid Up to Date	28-07-2024
Model Curriculum Version	3.0
Minimum Duration of the Course	330 Hours
Maximum Duration of the Course	330 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the participants will be able to:

- Produce all types of ice-cream in semi-automated and fully automated units
- Handle ice-cream processing machineries while maintaining process parameters
- Plan production sequence as per production order
- Document and record necessary as required in the work process
- Observe food safety and hygiene standards at work

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
FIC/N2013 Prepare and maintain work area and machineries for production of ice cream NOS Version No.: 1.0 NSQF Level: 4	**20:00 Hours**	**40:00 Hours**	**00:00Hours**	**00:00Hours**	**60:00 Hours**
Module1: Introduction to the training program	02:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	02:00 Hours

Module2: Prepare and Maintain work area and process machineries	18:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	58:00 Hours
FIC/N2014 Prepare for production of ice cream NOS Version No.: 1.0 NSQF Level: 4	**20:00 Hours**	**40:00 Hours**	**00:00 Hours**	**00:00 Hours**	**60:00 Hours**
Module3: Produce Ice Cream	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
FIC/N2015 Produce ice cream NOS Version No.: 1.0 NSQF Level: 4	**30:00 Hours**	**90:00 Hours**	**00:00 Hours**	**00:00 Hours**	**120:00 Hours**
Module 4: Carry out processing of Ice Cream	30:00 Hours	90:00 Hours	00:00 Hours	00:00 Hours	120:00 Hours
FIC/N2016 Complete documentation and record keeping related to production of ice cream NOS Version No.: 1.0 NSQF Level: 4	**10:00 Hours**	**20:00 Hours**	**00:00 Hours**	**00:00 Hours**	**30:00 Hours**
Module5: Document and record information	10:00 Hours	20:00 Hours	00:00Hours	00:00Hours	30:00 Hours
FIC/N9001 Ensure Food safety, hygiene and sanitation for processing food products NOS Version No.: 1.0 NSQF Level: 4	**10:00 Hours**	**20:00 Hours**	**00:00 Hours**	**00:00 Hours**	**30:00 Hours**
Module 6: Ensuring food safety, personal hygiene and workplace sanitation	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
DGT/VSQ/N0101 Employability Skills NOS Version No.: 1.0 NSQF Level: 2	**12:00 Hours**	**18:00 Hours**	**00:00Hours**	**00:00Hours**	**30:00 Hours**
Module 7: Employability skills	12:00 Hours	18:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Total Duration	**102:00 Hours**	**228:00 Hours**	**00:00 Hours**	**00:00Hours**	**330:00 Hours**

Module Details

Module1: Introduction to the training program
Mapped to FIC/N2013, v1.0

Terminal Outcomes:

- Discuss the roles and opportunities available for Ice cream processing technician
- Explain food processing and its sub-sectors
- Discuss the current market and future trends of food processing sector

Duration: *02:00*	Duration:*00:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- Introduce each other and build rapport with fellow participants and the trainer. - Explain food processing. - List the various sub-sectors of food processing industry - Discuss the future trends and career growth opportunities available to ice cream processing technician in the food processing industry. - Summarize the key roles and responsibilities of ice cream processing technician. - Discuss the organizational standards and norms	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Prepare and maintain work area and process machineries
Mapped to FIC/N2013, v1.0

Terminal Outcomes:

- Describe the major functions carried out related to sanitation and maintenance before starting production
- Describe pre-cleaning work area and machinery

Duration: *18:00*	Duration: *40:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- List the materials and equipment used in the cleaning and maintenance of the work area. - List the common detergents and sanitizers used in cleaning work area and machineries. - Describe the methods of cleaning and sanitization. - Describe CIP method of cleaning. - Describe SIP method of cleaning. - Explain the method of managing and disposing waste material. - Describe the functions to be carried out before starting production. - Explain the maintenance procedure to be followed for dairy processing machineries before starting production. - List the different types of maintenance procedures.	- Demonstrate the process of preparing the work area for scheduled production. - Show how to clean the work area and machineries to prepare for ice cream processing. - Display the procedure to rectify faults and minor repairs in process machinery. - Show how to maintain the tools and machines utilised for production.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	

White/Black board/ Chart paper, Markers/ computer and projector, Trainer's guide, student handbook, approved sanitizers for cleaning of the work area and machineries, approved lubricators, dustbins, necessary tools to attend minor repair work in process machinery, Motor (AC), DifferentSizeofStainlessSteel(SS)Pipes,DifferentSizeofAngles(SS),DifferentSizeofJoint (SS), Different Size of Valves(SS), Plates of Heat Exchanger(SS), mixy, Weighing Machine, gas with burners and cream freezer

Module 3: Produce Ice Cream
Mapped to FIC/N2014, v1.0

Terminal Outcomes:

- List the tasks to be performed to prepare for ice cream production
- Demonstrate the techniques to be followed to inspect and prepare the raw materials as per desirable standards

Duration: *20:00*	Duration: *40:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- Describe the process of planning. Production sequence to maximize capacity utilization of resources. - List the factors affecting operation efficiency during production. - List the ingredients required for production. - List the raw materials, packaging materials, manpower, equipment and machineries for the scheduled production. - Explain the methods for storing raw materials for later use.	- Apply basic mathematics for various calculations in day-to-day processes. - Plan the production schedule as per organizational standards and instructions. - Check the raw material quality and grade. - Prepare the raw material for production. - Calculate batch size and prioritize urgent orders based on the production schedule and machine capacity. - Inspect the conformance of raw material quality to company standards. - Organize quality raw material as per production process and company standards. - Plan the production sequence to maximize capacity, utilization of resources, manpower and machinery.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Nil	

Module 4: Carry out processing of Ice-Cream
Mapped to FIC/N2015, v1.0

Terminal Outcomes:

- Discuss the process and steps involved in ice cream production
- Demonstrate the standard practice followed to produce ice cream

Duration:*30:00*	Duration:*90:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- Explain the process for producing various types of ice- cream and frozen dessert. - List the composition of different types of ice-cream. - Describe the method of pre-heating ice-cream mix. - Discuss the method of ageing the ice-cream mix. - State the method of estimating the overrun in ice-cream and frozen dessert. - Describe quality parameters analyzed in ice cream production - List the factors to consider during the packing of ice-cream. - List the materials used for packaging ice-cream. - Explain the method of hardening and storage in ice-cream. - Describe post-production cleaning methods and waste management procedures	- Demonstrate the process of making the mix. - Demonstrate the method of blending the ice-cream mix. - Perform the process of filtration for making an ice-cream mix. - Demonstrate the method of homogenization of ice-cream mix. - Perform pasteurization of ice-cream mix. - Demonstrate the method of cooling the ice-cream mix. - Demonstrate the method of freezing the ice-cream mix. - Demonstrate the process of producing frozen desserts. - Demonstrate the process of producing plain ice-cream. - Demonstrate the process of producing premium ice-cream. - Demonstrate the process of producing kulfi. - Demonstrate the process of producing syrup. - Demonstrate the process of cleaning the work area and machineries after production.
Classroom Aids:	
Computer, Projection Equipment, Power Point Presentation and software, Facilitator's Guide,	

Participant's Handbook

Tools, Equipment and Other Requirements

Different Size of Valves (SS), Plates of Heat Exchanger (SS), Mixy, Muslin Cloth, Weighing Machine, Milk Sampling Bottle, Milk Stirrer, Nut bolts (different Sizes), Can (Aluminum/SS), Thermometer, Test Tube (Glass), Test Tube Holder, Gas with Burner, Measurement Cane,
Utensils to Heat the Milk, Joints/angles Opener, Cream Freezer, Fillers ,Wrappers and Packers, Moulds (Ice Cream Moulds)

Module 5: Document and record information

Mapped to FIC/N2016 v1.0

Terminal Outcomes:

- Discuss the importance of recording information in ice-cream processing
- Demonstrate the standard practice followed to record production information

Duration: *10:00*	Duration: *20:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- Discuss the importance of documentation and maintaining records during the entire work process. - List of information to be recorded as per the production work. - State ERP and maintaining documentation via ERP	- Document necessary information such as production plan, process parameters, and finished products. - Prepare records to record information as per production and organizational requirements.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Food safety manual, log books.	

Module 6: Ensure food safety, personal hygiene and workplace sanitation
Mapped to FIC/N9001 v1.0

Terminal Outcomes:

- Discuss HACCP and FSMS
- Demonstrate the tasks to be performed for ensuring health and safety at the workplace

Duration:*10:00*	Duration:*20:00*
Theory –Key Learning Outcomes	**Practical–Key Learning Outcomes**
- Discuss the importance of safety, hygiene and sanitation in the dairy processing. - Discuss the relevant HACCP principles to be followed in the dairy industry. - Describe GMP procedures as per FSSAI guidelines and GHP - Describe Hazards and its type	- Demonstrate the steps to be performed to maintain a safe and hygiene workplace. - Demonstrate the steps to be performed to implement HACCP practices for ensuring food safety. - Roleplay a situation depicting the safety practices to be followed at the workplace.
Classroom Aids:	
Computer,ProjectionEquipment,PowerPointPresentationandsoftware,Facilitator'sGuide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Protective gloves, headcaps,aprons,safetygoggles,safetyboots,mouthcovers,sanitizer,food safety manual ,logbooks etc.	

Module 7: Employability skills
Mapped to DGT/VSQ/N0101, v 1.0

Terminal Outcomes:

- Describe the traits of individual at workplace
- Apply employability and entrepreneurship skills at workplace

Duration: *12:00*	Duration: *18:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss own strengths and weaknesses and analyse the gaps to ensure continuous improvement. • Discuss the measures to be undertaken to utilise time effectively thereby achieving maximum productivity. • List the characteristics of innovative individuals • List the levels of Maslow Hierarchy of needs • List the traits of effective team • Discuss tips for stress management • Discuss the importance of good work ethics • Discuss how to manage an enterprise • Describe how to plan effective strategies for solving problems and improving work culture within the team. • List the various types of digital marketing techniques. • Discuss the types and importance of e-commerce in promoting businesses. • List the various types of online banking services being used widely. • Discuss the procedure to apply for bank finances • List the elements of a proposal to attract future business opportunities and prospective clients. • Explain how to conduct entrepreneurial programs to identify business opportunities, generate employment and	• Show how to analyse a situation to identify gaps for improving the work process. • Demonstrate the procedure to plan the time taken to perform various tasks effectively. • Describe how market research is carried out • Role play the characteristics of an effective entrepreneur and leader • Demonstrate on how to identify new business opportunities • Prepare a sample plan to solve problems and improve productivity at the workplace. • Demonstrate the procedure to operate a computer for digital marketing, e-commerce, branding, etc. • Show how to use services such as NEFT, IMPS, UPI, RTGS for online banking.

increase clientele.
- Understand the make in India campaign
- Discuss the importance of Swachh Bharat Abhiyan
- Understand the importance of entrepreneurship
- Describe the traits of successful entrepreneur
- List the types of enterprises
- Understand the importance of effective speaking and listening
- Discuss the importance of problem solving
- Discuss how to deal with failures
- Describe the core keys of marketing
- Discuss ways to manage risks at workplace

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.

Tools, Equipment and Other Requirements

Nil

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	*Specialization*	*Years*	*Specialization*	
Diploma	Dairy Technology	4	Dairy industry	1	Training of Ice cream processing technicians	
B. Sc./B. Tech/BE	Dairy Technology	2	Dairy industry	1	Training of Ice cream processing technicians	
M. Sc./M. Tech/ME	Dairy Technology	1	Dairy industry	1	Training of Ice cream processing technicians	

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Ice Cream Processing Technician" mapped to QP: "FIC/Q2004, v3.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	*Specialization*	*Years*	*Specialization*	
Diploma	Dairy Technology	4	Dairy industry	1	Assessment of Ice cream processing technicians	
B. Sc./B. Tech/BE	Dairy Technology	2	Dairy industry	1	Assessment of Ice cream processing technicians	
M. Sc./M. Tech/ME	Dairy Technology	1	Dairy industry	1	Assessment of Ice cream processing technicians	

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Ice Cream processing Technician" mapped to QP: "FIC/Q2004, v3.0". Minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: "Assessor", mapped to the Qualification Pack: "MEP/Q2701". Minimum accepted score as per MEPSC guidelines is 80%.

Assessment Strategy

This section includes the processes involved in identifying, gathering and interpreting information to evaluate the learner on the required competencies of the program.

Assessment will be based on the concept of Independent Assessors empanelled with Assessment Agencies, identified, selected, trained and certified on Assessment techniques. These assessors would be aligned to assess as per the laid down criteria.

Assessment Agency would conduct assessment only at the training centres of Training Partner or designated testing centers authorized by FICSI.

Ideally, the assessment will be a continuous process comprising of three distinct steps:

A. Mid- term assessment
B. Term / Final Assessment

Each National Occupational Standard (NOS) in the respective QPs will be assigned weightage. Therein each Performance Criteria in the NOS will be assigned marks for theory and / or practical based on relative importance and criticality of function.

This will facilitate preparation of question bank / paper sets for each of the QPs. Each of these papers sets / question bank so created by the Assessment Agency will be validated by the industry subject matter experts through FICSI, especially with regard to the practical test and the defined tolerances, finish, accuracy etc.

The following tools are proposed to be used for final assessment:

i. Written Test: This will comprise of (i) True / False Statements (ii) Multiple Choice Questions (iii) Matching Type Questions. Online system for this will be preferred.

ii. Practical Test: This will comprise a test job to be prepared as per project briefing following appropriate working steps, using necessary tools, equipment and instruments. Through observation it will be possible to ascertain candidate's aptitude, attention to details, quality consciousness etc. The end product will be measured against the pre-decided MCQ filled by the Assessor to gauge the level of his skill achievements.

iii. Structured Interview: This tool will be used to assess the conceptual understanding and the behavioral aspects as regards the job role and the specific task at hand.

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
HACCP	Hazard Analysis and Critical Control Points
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices